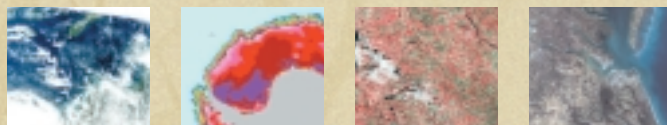


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Data & Information for global change studies

Remote Sensing



FROM THE DAAC ALLIANCE



Every day, NASA's Earth Observing System (EOS) program receives more than a terabyte of remotely sensed Earth science data from Terra and other Earth-observing satellites. The EOS Data and Information System (EOSDIS) manages the multidisciplinary data and makes the data available to users through Distributed Active Archive Centers (DAACs). The data centers of the DAAC Alliance, each specializing in a particular Earth science discipline, support the remote-sensing community with data products, information, and services useful to scientific research, education, policy development, and commercial applications.

This publication lists the member centers of the DAAC Alliance and their Earth science disciplines. It features examples of some of the many products and services the DAAC Alliance offers to the remote-sensing community.

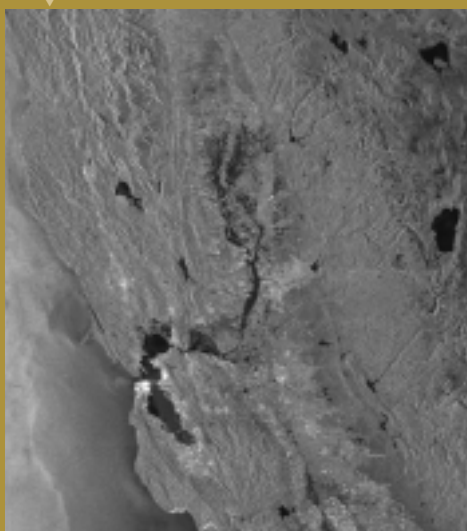
To learn more about the data centers and their products and services, and to obtain complete contact information, visit the DAAC Alliance Web site at

<http://nasadaacs.eos.nasa.gov>

To obtain the data products offered by the DAAC Alliance, contact the User Services Office at any DAAC, or visit the EOS Data Gateway online search-and-order service at

<http://eos.nasa.gov/imswelcome>

This RADARSAT-1 SAR image of San Francisco in 1998 was processed at ASF. The full ScanSAR Wide B frame of data was reduced for publication, but features as distant as Lake Tahoe are still present in this scene. © CSA, 1998



SAR Products and Polar Regions

ASF DAAC

Alaska SAR Facility
<http://www.asf.alaska.edu>

RADARSAT-1

Data from this C-Band SAR (Synthetic Aperture Radar) system are available from February 1996 to the present. The side-looking radar provides incidence angles ranging from approximately 20 to 60 degrees. Significant data coverage is available from seven ground station partners scattered throughout the world. Primary coverage exists within a 3,000-kilometer (km) radius circle about two receiving ground stations: ASF in Alaska and McMurdo Station in Antarctica. The data can be processed to resolutions ranging from 30 to 600 meters. Sea ice mapping is a primary application of RADARSAT-1 and other SAR data at ASF.

European Remote-Sensing Satellites (ERS-1 and ERS-2)

Data from these C-Band SAR systems are available from August 1991 to June 1996 for ERS-1 and from August 1996 to the present for ERS-2. The side-looking radar has an incidence angle of 23 degrees and a 100-km-swath width. Ground coverage exists within a 3,000-km radius circle about two receiving ground stations: ASF and McMurdo Station. The data can be processed to resolutions ranging from 30 to 240 meters.

Japanese Earth Remote-Sensing Satellite (JERS-1)

Data from this L-Band SAR system are available from May 1992 to October 1998. The side-looking radar has an incidence angle of 35 degrees and a 75-km-swath width. Coverage exists within a 2,600-km radius circle centered on Fairbanks, at resolutions ranging from 10 to 240 meters. Limited coverage outside this mask, including extensive Amazon and Boreal Forest data, is also available.

This Landsat 7 ETM+ image of southeastern South Dakota is the first scene (Path 29, Row 30) acquired by Landsat 7, just 3 days after its launch on April 15, 1999. In this false-color image, green vegetation appears in shades of red; bodies of water are black or, if sediment laden, blue; and fallow fields and soil show as green or light blue. (Image courtesy of EDC DAAC)

Land Processes

EDC DAAC

Earth Resources Observation Systems (EROS) Data Center
<http://edcdaac.usgs.gov>

Landsat 7 Enhanced Thematic Mapper (ETM+)

For land cover/type observations, Landsat 7 provides repetitive, synoptic coverage of continental surfaces; spectral bands in the visible and near-infrared (30-meter resolution), panchromatic (15), and thermal infrared (60) regions of the electromagnetic spectrum; and absolute radiometric calibration.

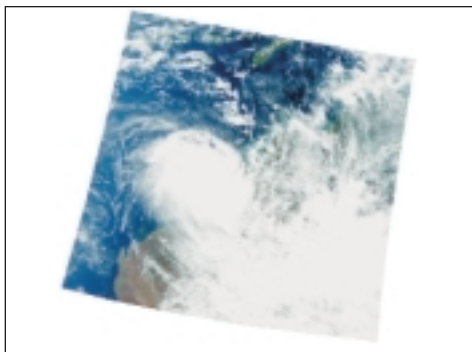
Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER)

One of five instruments on board the Terra satellite, ASTER obtains high-resolution image data in 14 channels as well as black-and-white stereo images. ASTER consists of three subsystems that operate in multispectral bands with resolutions of 15, 30, and 90 meters. The instrument is used to acquire land surface temperature, emissivity, reflectance, and elevation data.

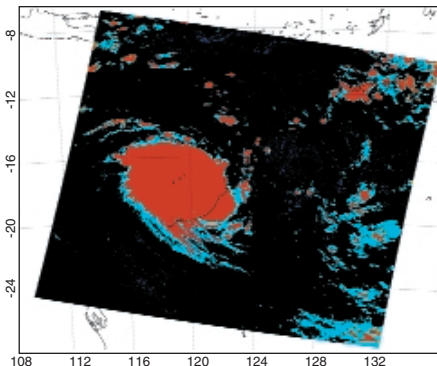
Moderate Resolution Imaging Spectroradiometer (MODIS)

On board Terra, MODIS acquires global data every 1 or 2 days in 36 spectral bands at multiple resolutions of 250, 500, and 1,000 meters. These data will improve the understanding of global processes by using the land discipline data provided by EDC, such as surface reflectance, land surface temperature, vegetation indices, thermal anomalies, and land cover/change.





MODIS Level 1B "pseudo-true-color" browse image (left) and cloud mask image (right) of the tropical storm Rosita in the Southern Indian Ocean, April 19, 2000. (Image courtesy of GSFC DAAC)



Global Hydrology

GHRC

Global Hydrology Resource Center
<http://ghrc.msfc.nasa.gov/>

Lightning Imaging Sensor (LIS)

LIS, on board the Tropical Rainfall Measuring Mission (TRMM) satellite, provides the only current lightning observations from space. LIS detects cloud-to-ground, cloud-to-cloud, and intracloud lightning flashes. LIS global measurements are available from 1998 to the present. Research data are also available from a precursor instrument (Optical Transient Detector) beginning in April 1995, and from surface radar and lightning validation sites.

Passive Microwave Atmospheric Parameters

The GHRC provides numerous atmospheric hydrology parameters derived from space-based passive microwave observations (Advanced Microwave Sounding Unit-A, Special Sensor Microwave/Imager, and TRMM Microwave Imager). These long-term data sets include atmospheric temperature, ocean wind speed, atmospheric water vapor, and cloud water.

Convection and Moisture Experiment (CAMEX)

CAMEX is a series of NASA aircraft field experiments focused on tropical cyclones and thunderstorm research. The CAMEX-3 project focused on the 1998 Atlantic hurricane season with flights through hurricanes Bonnie, Danielle, Earl, and Georges. The multiple instrument data sets provide high-spatial and temporal information about hurricane structure, dynamics, and motion.

Upper Atmosphere, Atmospheric Dynamics, Global Precipitation, Global Biosphere

GSFC DAAC

Goddard Space Flight Center
<http://daac.gsfc.nasa.gov/>

MODIS

With a viewing swath 2,330-km wide, MODIS, on board Terra, measures biological and physical parameters and processes on the Earth's surface and in the lower atmosphere simultaneously and at the same resolution. The GSFC DAAC archives and distributes MODIS radiometric and geolocation, atmospheric, and ocean products.

TRMM

Data contain visible, infrared, microwave, and spaceborne radar measurements of tropical and subtropical rain systems at 4-km resolution, and spatially and temporally resampled; ground validation radar data; and value-added products such as coincident satellite subsets. TRMM field experiment data include Doppler radar, gauge, aircraft and/or in situ measurements of hydrometeor distribution, atmospheric profiles, and surface flux measurements for rain and ecosystem studies and TRMM algorithm validations.

Physical Oceanography

JPL DAAC

Jet Propulsion Laboratory
<http://podaac.jpl.nasa.gov>

AVHRR Oceans Pathfinder SST

These Advanced Very High Resolution Radiometer (AVHRR) sea surface temperature data are a great improvement over the Multi-Channel Sea Surface Temperature (MCSST) product. Daily data at 9-km and coarser resolutions can be accessed, subset, and obtained by FTP.

SeaWinds

The SeaWinds instrument on QuikSCAT is designed to provide accurate global information about near-surface wind vectors. The measurements and data products show developing weather systems with unprecedented detail, enabling researchers to improve global weather forecasting. The SeaWinds instrument on ADEOS II is designed to continue the time series of wind vector observations over the ocean, and will be launched in early 2002.

TOPEX/Poseidon

The TOPEX/Poseidon mission was designed to provide information about the changing topography of the world's oceans, which helps scientists to understand the ocean's role in the global climate. TOPEX/Poseidon measures the global ocean topography every 10 days. The Jason-1 satellite is a follow-on mission to the TOPEX/Poseidon mission. It will carry a radar altimeter and will be launched in mid 2001.

Radiation Budget, Clouds, Aerosols, Tropospheric Chemistry

LaRC DAAC

Langley Research Center
<http://eosweb.larc.nasa.gov>

The LaRC DAAC archives and distributes several new remote-sensing data sets from ACRIM III, MOPITT, POAM III, and SAGE III (available 2001), as well as current products from the ERBE, ISCCP, and SAGE II projects. Satellite-derived data sets (SSE and SRB) and data from various field campaigns (AirMISR, FIRE, and GTE) are also available. Descriptions of all products from the LaRC DAAC are provided on the Web site given above. Examples of products from the LaRC DAAC's archive follow.

Clouds and the Earth's Radiant Energy System (CERES) Data Sets

CERES provides radiometric measurements of the Earth's atmosphere from three broadband channels that are used to derive information about Earth's radiation budget. The first CERES instrument was launched from Tanegashima, Japan, November 1997, on board TRMM. Two CERES instruments were launched into polar orbit on board EOS Terra, December 1999. Other CERES instruments are scheduled for launch on board EOS Aqua.

The Multi-angle Imaging Spectroradiometer (MISR)

From Terra's orbit 705 km above the Earth, a 360-km-wide swath of Earth is successively viewed by each of MISR's nine cameras during a period of 7 minutes, providing top-of-atmosphere, cloud, and surface angular reflectance functions. MISR data are used for monitoring changes in clouds, the Earth's surface, and pollution particles in the air, and for assessing their impact on climate. MISR also provides global maps of planetary and surface albedo, and aerosol and vegetation properties.



▲ These MISR images of the Delaware Bay, Chesapeake Bay, and Appalachian Mountains were acquired March 24, 2000, during Terra orbit 1417, by cameras oriented at different angles along the flight track. Differences in brightness, color, and contrast as a function of view angle are visible over both land and water. (Images courtesy of NASA/GSFC/JPL, MISR Science Team)

Snow and Ice, Cryosphere and Climate

NSIDC DAAC

National Snow and Ice Data Center
<http://nsidc.org>

MODIS

MODIS, on board Terra, permits the routine collection of very detailed spectral data that had been available only on much smaller scales. MODIS products at NSIDC include snow and sea ice. NSIDC currently distributes snow products and expects to distribute sea ice products soon. Both snow and sea ice products are processed in Level 2 (swath) and Level 3 (gridded) formats. The products are produced from daily, 8-day, and monthly composites. Sea ice products will be available separately for the Northern and Southern Hemispheres, and separately for day and night.

Passive Microwave Sea Ice Concentration Data

NSIDC distributes several daily and monthly sea ice products derived from the Nimbus-7 Scanning Multichannel Microwave Radiometer (SMMR) and Defense Meteorological Satellite Program (DMSP) Special Sensor Microwave/Imager (SSM/I) instruments in the polar stereographic projection. Grid cell size for these data is 25 by 25 km. Temporal coverage varies, but includes an ongoing SSM/I product (3- to 6-month lag between collection and availability), a SMMR and SSM/I time series, and a near-real-time product. Data are available from both the NASA Team and Bootstrap algorithms. Appropriate applications of these data sets vary.

Biogeochemical Dynamics

ORNL DAAC

Oak Ridge National Laboratory
<http://www.daac.ornl.gov>

The ORNL DAAC offers a variety of remote-sensing data and field data for specific ecosystems, as well as regional and global data. Examples include the following data products.

Boreal Ecosystem-Atmosphere Study (BOREAS)

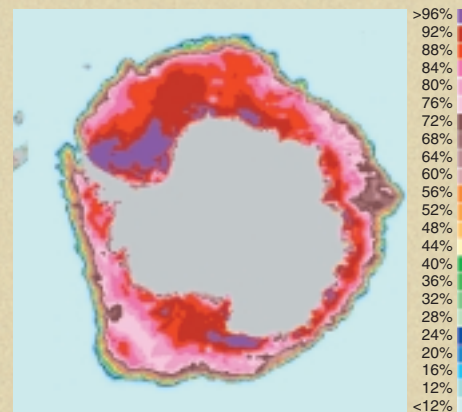
Surface, airborne, and satellite data are available from BOREAS from 1993 to 1996. BOREAS investigators characterized the biological and physical processes governing exchanges of energy, water, heat, carbon dioxide, and trace gases between a Canadian boreal forest and the atmosphere.

First ISLSCP Field Experiment (FIFE)

Holdings include satellite and aircraft image products related to the International Satellite Land Surface Climatology Project (ISLSCP). FIFE researchers studied carbon and water cycles in a prairie ecosystem in central Kansas from 1987 to 1989.

Large-Scale Biosphere-Atmosphere Experiment in Amazonia (LBA)

Background data are available from LBA, an international study of the tropical rainforest in Brazil and adjacent countries. Through ground-based experiments and remote sensing, researchers are studying the atmosphere-biosphere-hydrosphere dynamics of Amazonia.



▲ Passive microwave observations of polar oceans are essential for tracking ice edges, estimating sea ice concentration, and classifying sea ice types. This image showing the average monthly percentage of sea ice concentrations in the Antarctic for September 1999 is from the DMSP SSM/I Daily and Monthly Polar Gridded Sea Ice Concentrations data set available at NSIDC. (Image courtesy of NSIDC)

Oregon Transect Ecosystem Research (OTTER)

Data include satellite and aircraft images from the OTTER Project, conducted in Oregon from 1989 to 1991. OTTER researchers studied the biophysical characteristics of plant canopies in western coniferous forests.

Human Interactions in the Environment

SEDAC

Socioeconomic Data and Applications Center
<http://sedac.ciesin.org>

Near-Real-Time Estimates of UV Dose Using EP/TOMS Data

The data consist of maps that represent local noon estimates of the Ultraviolet Index (UVI) and total daily integrated erythemal dose amounts generated at a 1- by 1-degree latitude/longitude resolution using near-real-time total column ozone abundances measured by NASA's Total Ozone Mapping Spectrometer (TOMS) instruments carried on board the Earth Probe (EP) satellite platform.

Ultraviolet Interactive Service (UVIS)

UVIS provides onscreen visualization of hourly, daily, and monthly averaged ultraviolet radiation dose quantities and corresponding total column ozone values from TOMS.